

FIG. 1

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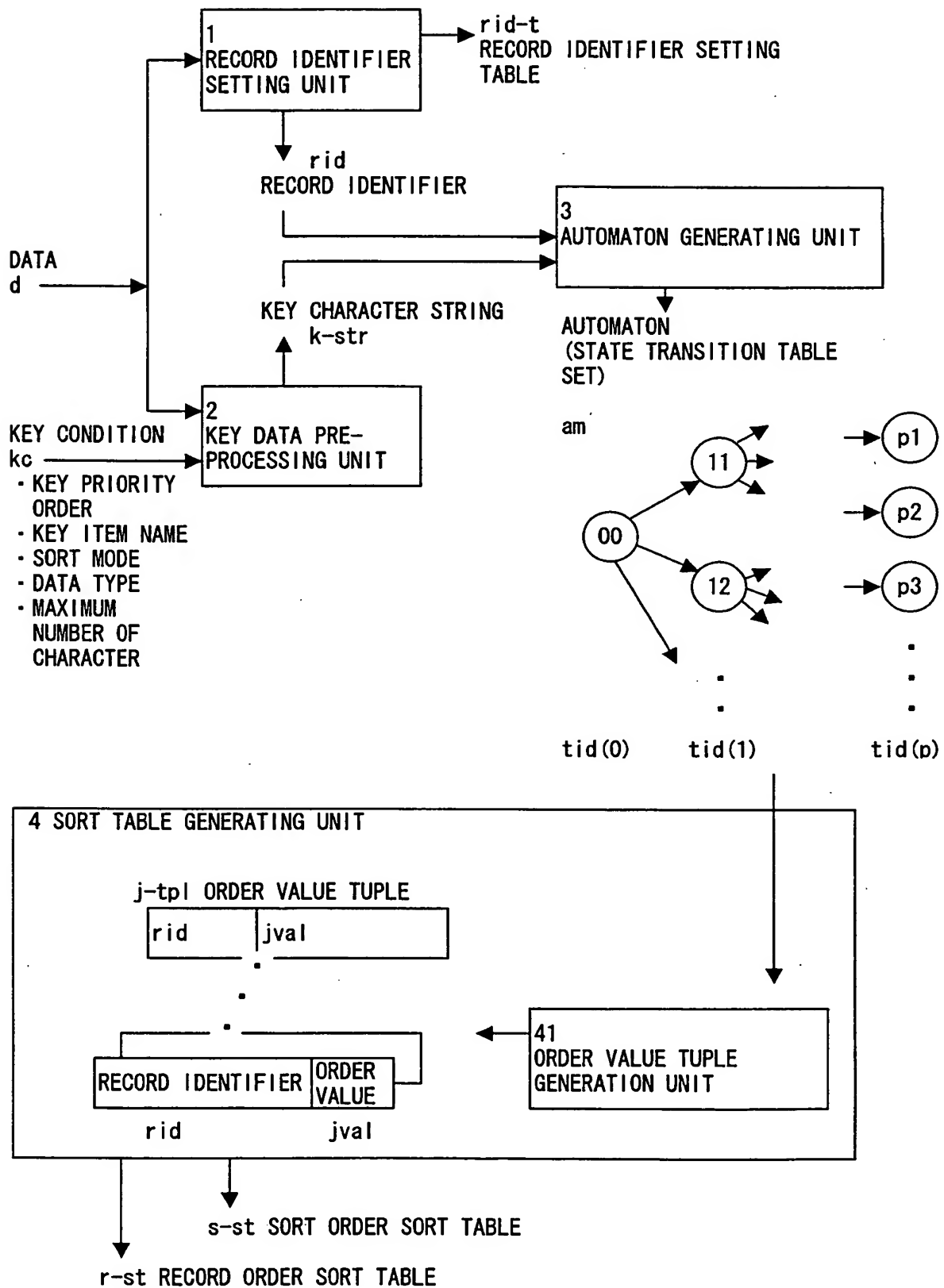


FIG. 2

(A) EXAMPLE OF SETTING KEY CHARACTER STRING WHEN VALUE OF KEY ITEM IS CHARACTER STRING '富士通' (THREE JAPANESE CHARACTERS)

	NUMBER OF BITS OF CHARACTER UNIT	16	8	4
SJIS CODE 9578 OF CHARACTER '富' (ONE JAPANESE CHARACTER)	FIRST CHARACTER	9578	95	9
	SECOND CHARACTER	8E6D	78	5
	THIRD CHARACTER	92CF	8E	7
	FOURTH CHARACTER	.	6D	8
	FIFTH CHARACTER	.	92	8
	SIXTH CHARACTER	.	CA	E
SJIS CODE 8E6D OF CHARACTER '士' (ONE JAPANESE CHARACTER)

SJIS CODE 92CF OF CHARACTER '通' (ONE JAPANESE CHARACTER)

MAXIMUM NUMBER OF TRANSITION STATES		65536	256	16

(B) EXAMPLE OF CONFIGURATION OF p-TH CHARACTER RECEPTION STATE TRANSITION TABLE WHEN KEY CHARACTER STRING k-str IS A 4-BIT CHARACTER

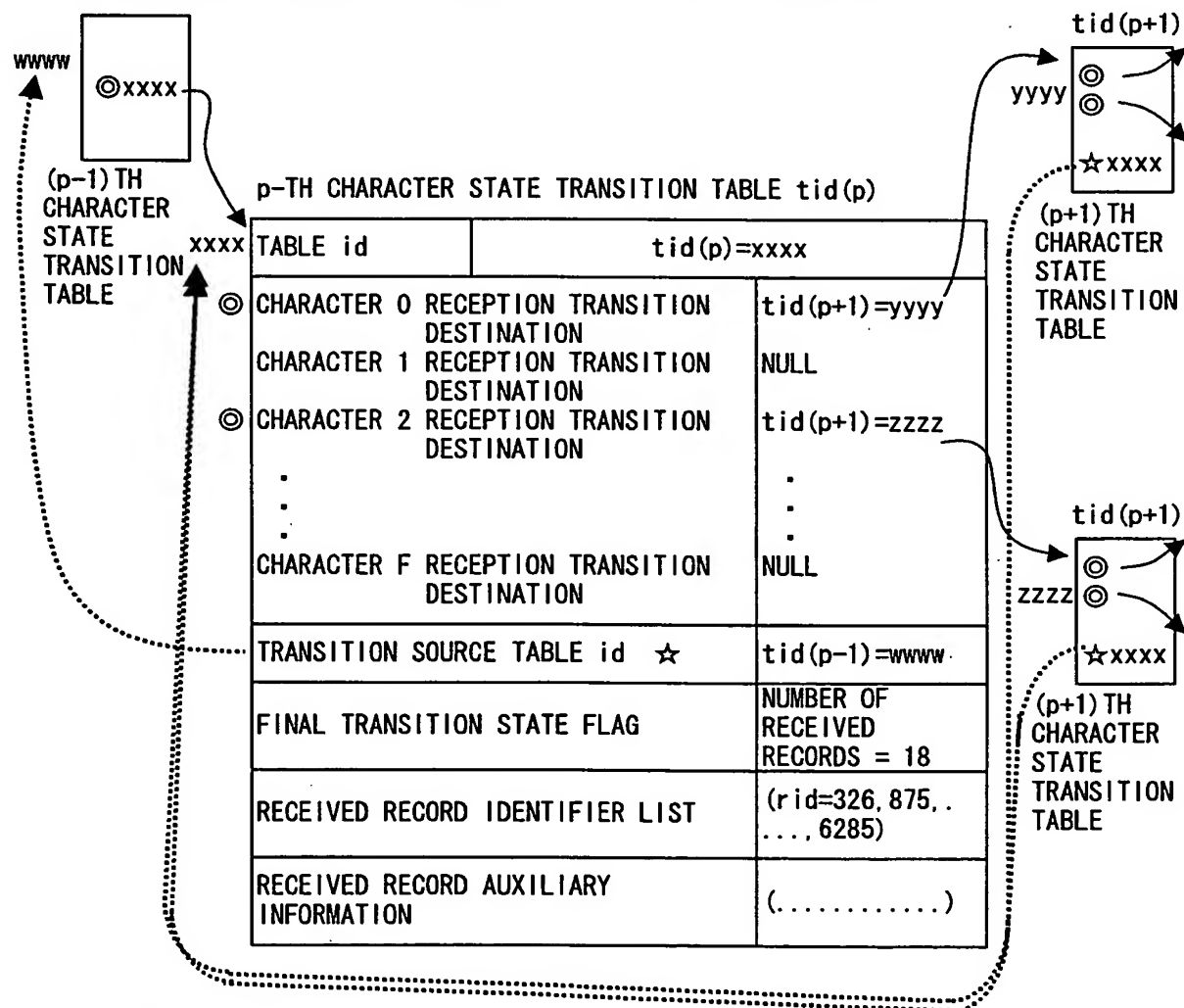


FIG. 3

(A) EXAMPLE OF STRUCTURE OF DATA d

RECORD IDENTIFIER rid = 1 →	<PART CODE>15<NAME>安倍太郎 (FOUR JAPANESE CHARACTERS) <FISCAL YEAR IN WHICH THE PERSON JOINED THE COMPANY>90 <SALES>900<R-END>
RECORD IDENTIFIER rid = 2 →	<PART CODE>01<NAME>松浦一郎 (FOUR JAPANESE CHARACTERS) <FISCAL YEAR IN WHICH THE PERSON JOINED THE COMPANY>90 <SALES>900<R-END>
.	<PART CODE>15<NAME>田端花子 (FOUR JAPANESE CHARACTERS) <FISCAL YEAR IN WHICH THE PERSON JOINED THE COMPANY>92 <SALES>605<R-END>
.	<PART CODE>07<NAME>永田正夫 (FOUR JAPANESE CHARACTERS) <FISCAL YEAR IN WHICH THE PERSON JOINED THE COMPANY>95 <SALES>850<R-END>
.	<PART CODE>02<NAME>原裕太 (THREE JAPANESE CHARACTERS) <FISCAL YEAR IN WHICH THE PERSON JOINED THE COMPANY>97 <SALES>605<R-END>
RECORD IDENTIFIER rid = Rmax <R-END> EOF

(B) EXAMPLE OF SETTING KEY CONDITION kc

KEY PRIORITY	1	2	3
KEY ITEM NAME	<SALES>	<FISCAL YEAR IN WHICH THE PERSON JOINED THE COMPANY>	<PART CODE>
SORT MODE	DESCENDING ORDER	ASCENDING ORDER	ASCENDING ORDER
DATA TYPE	TYPE = NUMBER 0 SUPPRESS CAN BE SET DECIMAL NUMBER CAN BE SET POSITIVE/NEGATIVE SIGN CAN BE SET ARGUMENT INDEX REPRESENTATION CAN BE SET SPACE INSERTION CAN BE SET FULL/HALF SIZE CHARACTERS CAN COEXIST	TYPE = NUMBER 0 SUPPRESS CANNOT BE SET DECIMAL NUMBER CANNOT BE SET POSITIVE/NEGATIVE SIGN CANNOT BE SET ARGUMENT INDEX REPRESENTATION CANNOT BE SET SPACE INSERTION CANNOT BE SET FULL/HALF SIZE CHARACTER CANNOT COEXIST	TYPE = CHARACTER STRING
MAXIMUM NUMBER OF CHARACTERS	10	—	—

(C) EXAMPLE OF PRE-PROCESSING KEY DATA BASED ON KEY CONDITION kc

KEY CONDITION kc	KEY DATA	INPUT CHARACTER STRING	KEY CHARACTER STRING k-str	NUMBER OF CHARACTERS
TYPE = CHARACTER STRING	-123.456	x2D3132332E343536	x2D3132332E343536	16
TYPE = NUMBER	2	x32	xC0000002	8
	15	x3135	xC080000F	8
	03	x3033	xC0000003	8
	-123.456	x2D3132332E343536	x4181E240	8

INTERNAL CHARACTER STRING CHANGE SPECIFICATION OF NUMBER TYPE: FLOATING POINT FORMAT
SIGN PORTION 1 BIT NEGATIVE = 0, POSITIVE = 1 (*)
INDEX PORTION INDEX SIGN PORTION 1 BIT NEGATIVE = 0, POSITIVE = 1 (*)
INDEX ABSOLUTE NUMBER 7 BITS
ARGUMENT PORTION ARGUMENT INTEGER VALUE 23 BITS
(*) INDICATES DIFFERENCE FROM COMMON ANSI/IEEE STANDARD 754 FLOATING POINT FORMAT.

F I G. 4

(A) EXAMPLE OF DATA STRUCTURE OF ORDER VALUE TUPLE j-tp1 AND PLURAL ORDER VALUE TUPLE

RECORD IDENTIFIER rid	FIRST PRIORITY KEY ORDER VALUE jval (1)	SECOND PRIORITY KEY ORDER VALUE jval (2)	...	K-TH PRIORITY KEY ORDER VALUE jval (K)
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(B) EXAMPLE OF STRUCTURE OF SORT ORDER SORT TABLE s-st

ORDER VALUE jval	RECORD IDENTIFIER rid
1	301
2	158
3	23
3	1687
5	14
.	.

NOTE) NORMALLY, SAME ORDER VALUE jval CAN CORRESPOND TO A PLURALITY OF RECORD IDENTIFIERS rid

(C) EXAMPLE OF STRUCTURE OF RECORD ORDER SORT TABLE r-st

RECORD IDENTIFIER rid	FIRST PRIORITY KEY		SECOND PRIORITY KEY		K-TH PRIORITY KEY
	LOST KEY FLAG	ORDER VALUE jval	LOST KEY FLAG	ORDER VALUE jval	
1		251		68	106
2		38		497	184
3	LOSING	max(1)		711	992
4		574		25	78
5		398		56	LOSING max(K)
6		16	LOSING	max(2)	532
.

NOTE) VALUES OF max(1), max(2), ..., max(K) ARE DETERMINED IN ORDER VALUE TUPLE GENERATING STEP

FIG. 5

(A) EXAMPLE OF OPERATIONS IN INITIALIZING STEP (STEP S11 IN FIG. 1)

RECORD IDENTIFIER SETTING UNIT 1 SETS AREA OF RECORD IDENTIFIER SETTING TABLE $rid-t$, AND RESETS READ RECORD NUMBER VARIABLE rr ($rr \leftarrow 0$).
 KEY DATA PRE-PROCESSING UNIT 2 READS AND STORES KEY CONDITION kc .
 NUMBER OF KEY ITEMS IS OBTAINED FROM KEY DATA PRE-PROCESSING UNIT 2, AND AREA OF RECORD ORDER SORT TABLE $r-st$ IS SET.
 AREA OF SORT ORDER SORT TABLE $s-st$ IS SET.
 k -TH PRIORITY KEY INITIAL STATE TRANSITION TABLE $tid-k(0)$ IS SET. $tid-k(0) = iii(k)$

(B) EXAMPLE OF OPERATION IN RECORD IDENTIFIER SETTING STEP (STEP S14 SHOWN IN FIG. 1)

READ RECORD NUMBER VARIABLE $rr \leftarrow [rr] + 1$ (INCREMENT).
 RECORD IDENTIFIER $rid \leftarrow [rr]$, STARTING ADDRESS OFFSET VALUE, AND RECORD LENGTH ARE SET IN RECORD IDENTIFIER SETTING TABLE $rid-t$.
 RECORD IDENTIFIER $rid \leftarrow [rr]$ IS ENTERED IN RECORD ORDER SORT TABLE $r-st$.

(C) EXAMPLE OF OPERATIONS IN LOST KEY PROCESSING STEP (S110 IN FIG. 1)

LOST KEY FLAG IS SET IN RECORD IDENTIFIER rid ROW OF RECORD ORDER SORT TABLE $r-st$.
 ADDING 1 TO FINAL TRANSITION STATE FLAG COLUMN OF k -TH PRIORITY KEY INITIAL STATE TRANSITION TABLE $tid-k(0)$, AND RECORD IDENTIFIER rid IS APPENDED TO RECEIVED RECORD IDENTIFIER LIST COLUMN.

(D) EXAMPLE OF STRUCTURE OF RECORD IDENTIFIER SETTING TABLE $rid-t$

RECORD IDENTIFIER rid	STARTING ADDRESS OFFSET VALUE	RECORD LENGTH
1	0	45
2	45	40
3	85	45
4	130	38
5	168	38
6	.	.
.	.	.

FIG. 6

KEY CHARACTER STRING $k\text{-str} = c(1), c(2), \dots, c(C)$

NOTATION: $a \leftarrow v$ INDICATES THAT VALUE v IS ENTERED IN AREA a , AND THE CONTENTS OF AREA a IS DESCRIBED AS $[a]$. THEREFORE, $[a] = v$.
 $tp\{x\} \leftarrow v$ INDICATES THAT VALUE v IS ENTERED IN COLUMN x OF TABLE POINTER tp . THEREFORE, $[tp\{x\}] = v$.

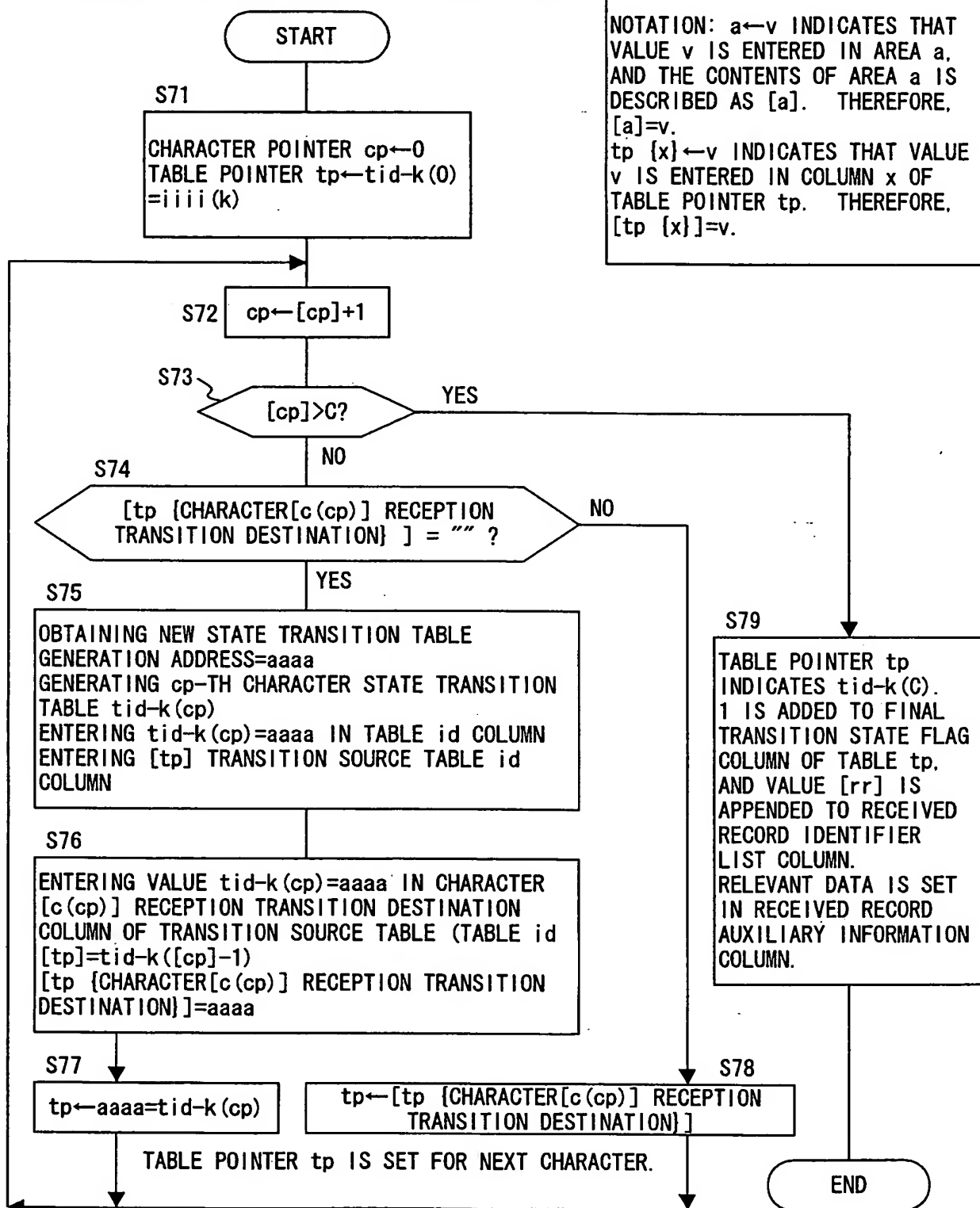


FIG. 7

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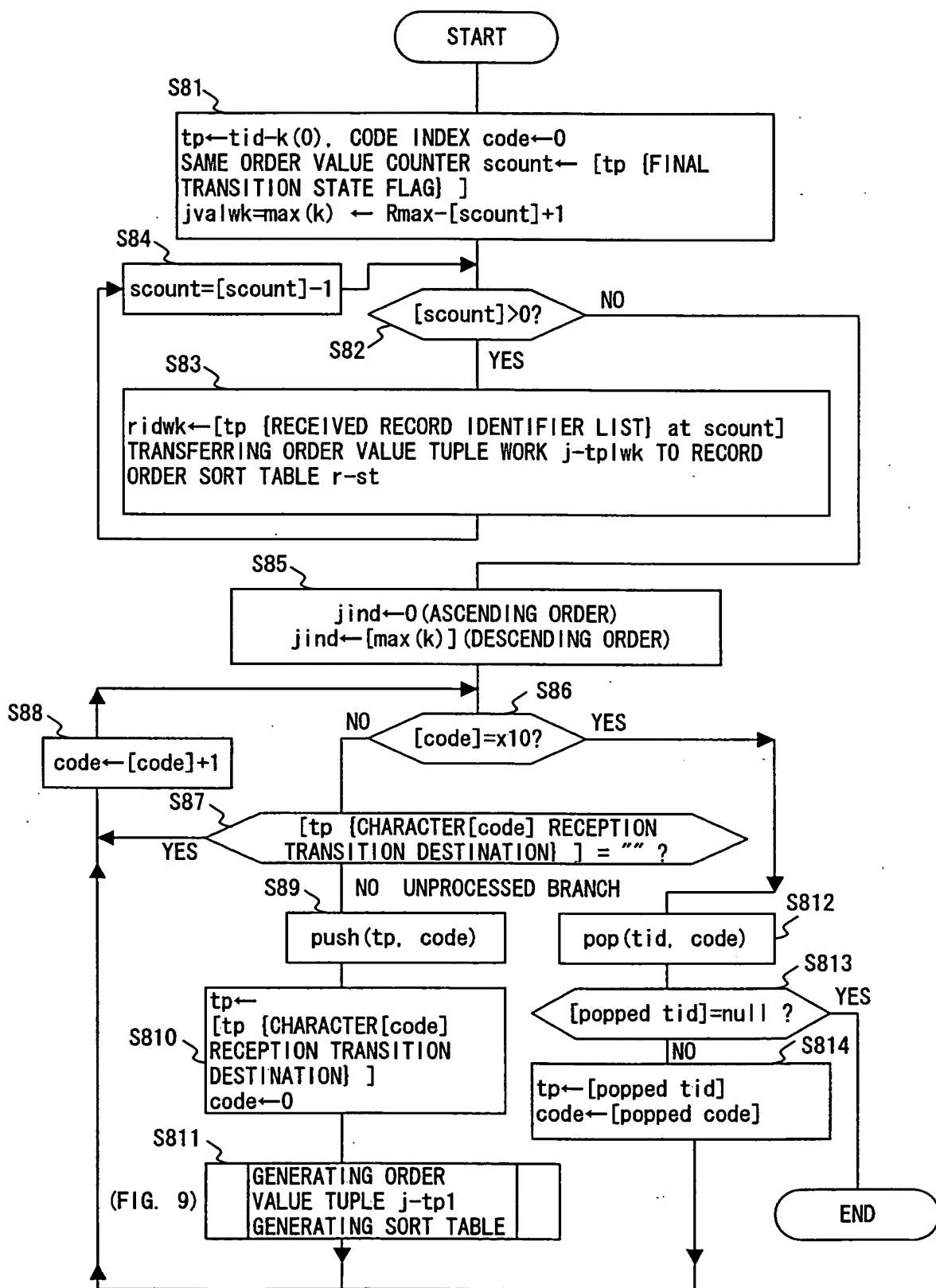


FIG. 8

INPUT: ORDER VALUE INDEX jind, SORT MODE FLAG sm(k), TABLE POINTER tp
 OUTPUT: ORDER VALUE TUPLE j-tpl (ORDER VALUE TUPLE WORK j-tplwk)
 RECORD ORDER SORT TABLE r-st; SORT ORDER SORT TABLE s-st (OPTIONAL)
 ORDER VALUE INDEX jind

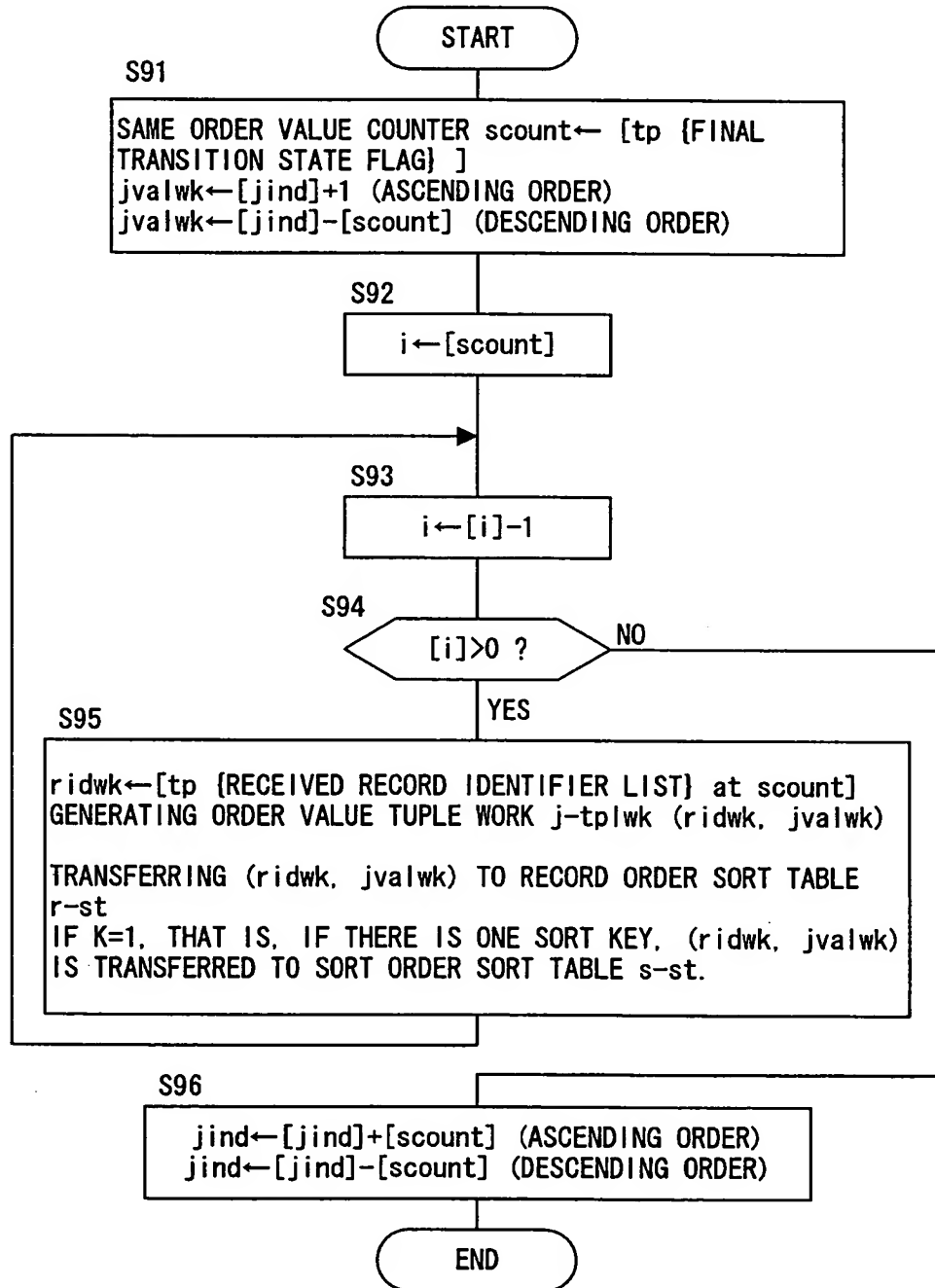


FIG. 9

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